

## PATENT ABSTRACTS OF JAPAN

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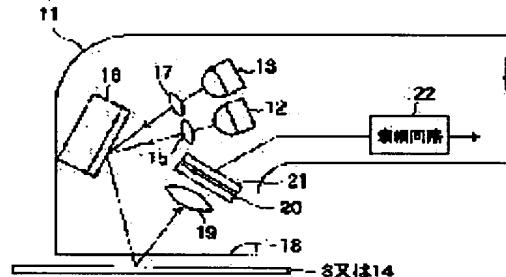
HIYOSHI TAKAYUKI

## (54) CODE READER

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To perform both code reading from a label on which a code is printed in transparent fluorescent ink and code reading from a label on which a code is printed in normal visible ink with only one reader.

**SOLUTION:** This device emits laser beam of wavelength that excites fluorescent ink from a 1st semiconductor laser oscillator 12 to a label 14 on which a bar code is printed in fluorescent ink that is transparent or hard to be seen, scans on the label by shaking the laser beam with a galvano mechanism 16, excites the fluorescent light of the bar code to emit light and makes only the light emitting light received by a photodetector 21 through a filter 20. Also, as for a label 8 on which a bar code is printed in normal visible ink, it shakes laser light from a 2nd semiconductor laser oscillator 13 with the galvano mechanism, scans on the label and makes reflected light from the label received by the photodetector through the filter 20.



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3. In the drawings, any words are not translated.

**[Claim(s)]**

**[Claim 1]** A code reader which reads said code in information which consists of an alphabetic character, a numeric character, etc. and a label which added a code required on management which is equipped with the following and characterized by using it, changing said two modes. The 1st mode in which irradiate light of wavelength which excites said fluorescence ink from the 1st light source to a label which printed a code in transparency or fluorescence ink which cannot appear easily, receive light in which said fluorescence ink emits light by this optical exposure by photo detector, and a code is read The 2nd mode in which irradiate light of wavelength which said photo detector can receive from the 2nd light source, receive the reflected light from a label by said photo detector to a label which printed a code in usual visible ink, and a code is read

**[Claim 2]** A code reader which reads said code in information which consists of an alphabetic character, a numeric character, etc. and a label which added a code required on management which is equipped with the following and characterized by using it, changing said two modes. The 1st mode in which irradiate light of wavelength which excites said fluorescence ink from the 1st light source to a label which printed a code in transparency or fluorescence ink which cannot appear easily, receive light in which said fluorescence ink emits light by this optical exposure by photo detector, and a code is read The 2nd mode in which irradiate light of wavelength which said photo detector can receive from the 2nd light source, receive the reflected light from a label by said photo detector to a label which printed a code in usual visible ink, and a code is read A filter which it arranges [ filter ] before said photo detector, and wavelength of light from said 1st light source is cut [ filter ], and makes wavelength of light from said 2nd light source penetrate

**[Claim 3]** A code reader which reads said code in information which consists of an alphabetic character, a numeric character, etc. and a label which added a code required on management which is equipped with the following and characterized by using it, changing said two modes. The 1st mode in which irradiate light of wavelength which said absorption ink absorbs from the 1st light source to a label printed in absorption ink

which used a charge of an absorber which absorbs transparency or specific wavelength which cannot be easily visible for a code, receive the reflected light which said absorption ink absorbed light by this optical exposure, and remained by photo detector, and a code is read The 2nd mode in which irradiate light of wavelength which said photo detector can receive from the 2nd light source, receive the reflected light from a label by said photo detector to a label which printed a code in usual visible ink, and a code is read

**[Detailed Description of the Invention]**

**[0001]**

[The technical field to which invention belongs] This invention relates to the code reader which reads said code in the information which consists of an alphabetic character, a numeric character, etc., and the label which added the code required on management.

**[0002]**

[Description of the Prior Art] Conventionally, as this kind of a code reader, although there is a thing of a handicap type or a fixed type For example, as a handicap type, as shown in drawing 12 , the semiconductor laser oscillator 2, a collimator lens 3, the GARUBANO device 4, the image formation lens 5, a photo detector 6, and amplifying-circuit 7 grade are contained in a case 1. A beam is extracted by letting a collimator lens 3 pass for the laser beam from the semiconductor laser oscillator 2. Make a laser beam shake by irradiating this in the reflector of the GARUBANO device 4, the bar code top of a label 8 is made to scan, and the reflected light from a label 8 is made to condense on a photo detector 6 through the image formation lens 5. A photo detector 6 changes light-receiving information into an electrical signal, after it amplifies this electrical signal in an amplifying circuit 7, it supplies it to the latter recognition section, and it detects a bar code in this recognition section. And as a label 8, as shown in drawing 13 , what put in order bar code 8c required on the information which consists of numeric character 8b, such as alphabetic character 8a, such as a trade name and a material, and a price, and a date, and management, and was printed in usual visible ink is used.

**[0003]**

[Problem(s) to be Solved by the Invention] Since the conventional label 8 arranges bar code 8c side by side with the information on alphabetic character 8a or numeric character 8b, in the size of a label having become large as a whole, but having made the alphabetic character and the numeric character small, a label becomes hard to see and inconvenience will be given to a visitor. Since it is such, it is possible to make label size small, printing the information on an alphabetic character required for a visitor, or a

numeric character in usual visible ink for example, and printing a required bar code in piles on the information on an alphabetic character or a numeric character in transparency or the fluorescence ink which cannot appear easily on the management which is unrelated to a visitor.

[0004] However, when it does in this way, the code reader of the dedication which can read fluorescence ink is needed for reading a bar code. On the other hand, it is most which is printing the bar code in visible ink as established goods, and the code reader which reads the bar code of visible ink for this reason is also needed. Thus, when a bar code was printed in transparency or the fluorescence ink which cannot appear easily and the miniaturization of label size was attained, about the established goods which perform read of a bar code with the code reader of dedication about the goods which stuck this label, and are printing the bar code in visible ink, read of a bar code had to be performed with the conventional code reader, and there was inconvenience that two code readers always had to be prepared.

[0005] Then, invention claim 1 and given in two offers the code reader which can perform read of the code from the label which printed codes, such as a bar code, in transparency or the fluorescence ink which cannot appear easily, and read of the code from the label which printed codes, such as a bar code, in usual visible ink by one set.

[0006] Invention according to claim 3 offers the code reader which can perform read of the code from the label which printed codes, such as a bar code, in the ink which used transparency or the charge of an absorber which cannot be easily visible, and read of the code from the label which printed codes, such as a bar code, in usual visible ink by one set.

[0007]

[Means for Solving the Problem] In a code reader which reads a code in information which invention according to claim 1 becomes from an alphabetic character, a numeric character, etc., and a label which added a code required on management As opposed to a label which printed a code in transparency or fluorescence ink which cannot appear easily The 1st mode in which irradiate light of wavelength which excites fluorescence ink from the 1st light source, receive light in which fluorescence ink emits light by this optical exposure by photo detector, and a code is read, It has the 2nd mode in which irradiate light of wavelength which a photo detector can receive from the 2nd light source, receive the reflected light from a label by photo detector to a label which printed a code in usual visible ink, and a code is read, and is in using it, changing the two modes.

[0008] In a code reader which reads a code in information which invention according to claim 2 becomes from an alphabetic character, a numeric character, etc., and a label which added a code required on management As opposed to a label which printed a code

in transparency or fluorescence ink which cannot appear easily. The 1st mode in which irradiate light of wavelength which excites fluorescence ink from the 1st light source, receive light in which fluorescence ink emits light by this optical exposure by photo detector, and a code is read. As opposed to a label which printed a code in usual visible ink. The 2nd mode in which irradiate light of wavelength which a photo detector can receive from the 2nd light source, receive the reflected light from a label by photo detector, and a code is read. It arranges before a photo detector, wavelength of light from the 1st light source is cut, and it has a filter which makes wavelength of light from the 2nd light source penetrate, and is in using it, changing the two modes.

[0009] In a code reader which reads a code in information which invention according to claim 3 becomes from an alphabetic character, a numeric character, etc., and a label which added a code required on management. As opposed to a label printed in absorption ink which used a charge of an absorber which absorbs transparency or specific wavelength which cannot be easily visible for a code. The 1st mode in which irradiate light of wavelength which absorption ink absorbs from the 1st light source, receive the reflected light which absorption ink absorbed light by this optical exposure, and remained by photo detector, and a code is read. It has the 2nd mode in which irradiate light of wavelength which a photo detector can receive from the 2nd light source, receive the reflected light from a label by photo detector to a label which printed a code in usual visible ink, and a code is read, and is in using it, changing the two modes.

[0010]

[Embodiment of the Invention] The gestalt of operation of this invention is explained with reference to a drawing. In addition, the gestalt of this operation describes what was applied to the handicap type code reader of this invention. As shown in drawing 1, the 2nd semiconductor laser oscillator 13 is arranged as the 1st semiconductor laser oscillator 12 and 2nd light source as the 1st light source in a case 11.

[0011] Said 1st semiconductor laser oscillator 12 prints the information which consists of numeric character 14b, such as alphabetic character 14a, such as a trade name and a material, and a price, and a date, in usual visible ink, as shown in drawing 2. It is for reading the bar code of fluorescence ink in the label 14 which printed bar code 14c required on management in piles to said alphabetic character 14a or numeric character 14b in transparency or the fluorescence ink which cannot appear easily, and the oscillation wavelength property changes with fluorescence materials currently used for fluorescence ink.

[0012] For example, in the case of the fluorescence ink which used the cyanine dye of NK-3803 (Japanese sensitizing dye research institute company make) as a fluorescence material, it is (b) of drawing 3 as 1st semiconductor laser oscillator 12. What has the

peak of oscillation wavelength is used near 780nm which has absorption of this fluorescence material so that it may be shown. Moreover, for example, in the case of the fluorescence ink which used IRS-F (Nemoto& Co., Ltd. make) as a fluorescence material, it is (c) of drawing 3 as 1st semiconductor laser oscillator 12. What has the peak of oscillation wavelength is used near 810nm which has absorption of this fluorescence material so that it may be shown.

[0013] As said 2nd semiconductor laser oscillator 13 is shown in drawing 13 mentioned above It is for reading bar code 8c in the label 8 which put in order and printed bar code 8c required on the information which consists of numeric character 8b, such as alphabetic character 8a, such as a trade name and a material, and a price, and a date, and management in usual visible ink. As the oscillation wavelength property, it is (a) of drawing 3 . What has the peak of oscillation wavelength is used near 669nm so that it may be shown.

[0014] A beam is extracted by the collimator lens 15, the laser beam from said 1st semiconductor laser oscillator 12 irradiates the reflector of the GARUBANO device 16, a beam is extracted by the collimator lens 17 and the laser beam from said 2nd semiconductor laser oscillator 13 is irradiated in the reflector of said GARUBANO device 16. Said GARUBANO device 16 makes the laser beam which irradiates a reflector turn and shake at the reading side 18, and scans the label [ which is located near the reading side 18 ] 8, or bar code top of 14 by the laser beam.

[0015] Although an adhesive layer is formed in a rear-face side and alphabetic character 14a and numeric character 14b are printed to a surface side, said label 14 prints an alphabetic character and a numeric character to emphasize in red, for example, and other alphabetic characters and numeric characters are black, and it prints them. When using a thermographic recording paper as said label, there are two kinds, a leuco color system and diazo \*\*. When performing 2 color coloring printing using this thermographic recording paper, there are a color addition method and a decolorization method. For example, if it prints at low temperature, the black of the 1st shot pigmented layer will color, if it prints at an elevated temperature, in the case of a decolorization method, the black of the 1st shot pigmented layer will decolorize, and the red of the 2nd shot pigmented layer will color it. An alphabetic character and a numeric character can be printed by red and two black colors by using this principle on the label which consists of a thermographic recording paper using a thermal head.

[0016] Drawing 4 is drawing showing the reflection property of a leuco color system, a drawing solid line shows the reflection factor in each wavelength of the black of a leuco color, and the drawing middle point line shows the reflection factor in each wavelength of the red of a leuco color. Any developed color does not almost have reflection up to near

550nm so that this reflection property may also show. That is, it is absorbing. And it sets black, and on the wavelength of 700nm or more, absorption decreases, a reflection factor becomes high, absorption decreases on the wavelength of 680nm or more in red, a reflection factor becomes high and any developed color serves as reflection of about 85% of abbreviation by 700nm or more. In addition, 85% of reflection at this time is relative evaluation when making reflection of a magnesium oxide into 100%.

[0017] Therefore, in what carried out 2 color coloring printing of an alphabetic character or the numeric character using the thermographic recording paper of a leuco color system, to the wavelength of 700nm or more, a reflection factor is high and serves as printing which reflects the wavelength of the laser beam from said 1st semiconductor laser oscillator 12, i.e., 780nm, (cyanine dye), and 810nm (IRS-F).

[0018] If the fluorescence ink which prints bar code 14c on alphabetic character 14a or numeric character 14b in said label 14 is transparency or fluorescence ink which cannot appear easily and is excited by light 700nm or more, it is good anything. Here, an example of the process of the fluorescence ink which used cyanine system coloring matter as a fluorescence material is described. JON krill SCX-70 (product made from Johnson POMARI) is used 3% of the weight as water soluble resin, and it uses NK-3803 (Japanese sensitizing dye research institute company make) as a solvent 0.03% of the weight as cyanine dye, and a surfactant is mixed for a diethylene glycol 37% of the weight, it mixes [ 0.1 % of the weight, other antiseptics, etc. ] a defoaming agent for water 0.87% of the weight 1% of the weight as an assistant 58% of the weight, and this fluorescence ink is manufactured.

[0019] First, JON krill SCX-70 and water are mixed and it agitates by the magnet stirrer. A diethylene glycol is added and agitated to this and a solvent is prepared. Next, a solvent is added and agitated to NK-3803. Similarly, it adds, agitating a surfactant, antiseptics, etc. And if it fully agitates, a defoaming agent will be added, carrying out pressure filtration and agitating with a 0.2-micron filter. This is deaerated and ink is made. In this way, the excitation property of the manufactured fluorescence ink comes to be shown in drawing 5 , and has an absorption peak near 780nm. Moreover, a luminescence property comes to be shown in drawing 6 , and the peak of luminescence wavelength is in 877nm.

[0020] Moreover, an example of the process of the fluorescence ink which used IRS-F as a fluorescence material is described. A styrene maleic acid is used 1% of the weight as water soluble resin, and it uses IRS-F (Nemoto& Co., Ltd. make) as a solvent 7.5% of the weight as a pigment, and a surfactant is mixed for a diethylene glycol 33% of the weight, it mixes [ 0.1 % of the weight, other antiseptics, etc. ] a defoaming agent for water 0.4% of the weight 3% of the weight as an assistant 55% of the weight, and this

fluorescence ink is manufactured.

[0021] First, styrene maleic resin is dissolved in water, and IRS-F and the surfactant which are a pigment are added and agitated in it. After a pigment is fully damp, the distributed ink ground to the particle using the disperser is obtained. As distributed conditions for a disperser, 1,500rpm and distributed time amount performed [ the rotational frequency ] temperature at the room temperature for 1 hour. And after adding antiseptics in the ink after distribution, fully agitating in it and carrying out pressure filtration to it with the filter of 0.2um, a defoaming agent is added agitating, degassing is carried out to the last, and dispersed system ink is made. In this way, the excitation property of the manufactured fluorescence ink comes to be shown in drawing 7, and has absorption wavelength near 750nm and near 810nm in a field 700nm or more. Moreover, a luminescence property comes to be shown in drawing 8, and the peak of luminescence wavelength is in 985nm.

[0022] In addition, although the case of the dissolution mold ink which used cyanine system coloring matter above, and the distributed ink using the pigment of an inorganic system was described, it does not limit to this. For example, the dispersed system fluorescence ink which mixes cyanine system coloring matter and a quencher at the time of the emulsion polymerization of an acrylonitrile copolymerization object, and is obtained is sufficient. Moreover, the fluorescence material of an others and phthalocyanine system and a naphthalocyanine system may be used as coloring matter. [ coloring matter / cyanine system ] In short, the fluorescence ink used for bar code printing of a label 14 should just be the thing of the property which shows absorption of 700nm or more, emits light, and does not excite and emit light by the laser beam from the 2nd semiconductor laser oscillator 13.

[0023] Printing of bar code 14c which used the fluorescence ink to said label 14 is performed using the ink jet arm head 31 of the method on demand using piezo (PZT) ones as shown in drawing 9. This ink jet arm head 31 supplies fluorescence ink to the pressure room 33 via the ink feed hopper 32 from an ink supply unit (not shown). 34 is made to transform. piezo one which is a piezo-electric member -- impressing a pulse voltage to the up electrode 35 and the lower electrode 36 of 34 -- piezo one -- Diaphragm 37 is deformed by this, pressure fluctuation is given to the pressure room 33, and bar code 14c is printed on a label 14 by making the fluorescence ink in the pressure room 33 fly from an orifice 38. In addition, as a method of printing bar code 14c, it may not limit to an ink jet method, and a hot printing method etc. may perform.

[0024] In addition, it is not what is limited to this although red and the case where it was black, carried out coloring printing of alphabetic character 14a or the numeric character 14b, and bar code 14c was printed on it using transparency or the fluorescence

ink which cannot appear easily were stated to the thermographic recording paper here. Even if it prints alphabetic character 14a and numeric character 14b by the ink jet method on the usual recording paper using the ink of blue, red, yellow, or black and prints bar code 14c on it using fluorescence ink Moreover, alphabetic character 14a and numeric character 14b may be printed by the hot printing method on the usual recording paper using an ink ribbon, and bar code 14c may be printed on it using fluorescence ink. Moreover, in that case, bar code 14c may be conversely printed in fluorescence ink first at the recording paper, and alphabetic character 14a and numeric character 14b may be printed on it. Even if such, reading of bar code 14c becomes possible.

[0025] For example, the relative luminescence output value in the case of being the case where the bar code of fluorescence ink has turned down when an alphabetic character and a numeric character are printed in each ink of the black of blue, red, yellow, and non carbon on the recording paper, and a top, Moreover, the relative luminescence output value in the case of being the case where the bar code of fluorescence ink has turned down when an alphabetic character and a numeric character are printed by the red ink ribbon on the recording paper, and a top, Furthermore, when an alphabetic character and a numeric character are printed by red coloring and black coloring to a thermographic recording paper, the relative luminescence output value in the case of being the case where the bar code of fluorescence ink has turned down, and a top is shown below. In addition, a relative output value is a relative output value when setting the luminescence output value of only the fluorescence material in the record paper to 100.

[0026]

Printing of an alphabetic character and a numeric character Fluorescence ink Below Fluorescence ink is a top. Blue ink 75 81 Red ink 87.5 106 Yellow ink 94 106 Black ink 63 81 Red ink ribbon 81 118 red coloring of a thermal paper -- 94 Black coloring of a thermal paper -- 81 -- a radiant power output detectable such enough is obtained. Therefore, any are sufficient as the printing sequence of fluorescence ink. And since it has repeated printing of bar code 14c which used visible printing, the transparency, or the fluorescence ink that cannot appear easily of numeric character 14b, such as alphabetic character 14a, such as a trade name and a material, and a price, and a date, a label 14 can make label size small, moreover, it haves to make small neither an alphabetic character nor a numeric character, takes it to a visitor, and turns into a legible label.

[0027] When a read object is bar code 8c on a label 8, the 1st semiconductor laser oscillator 12 is turned off, the 2nd semiconductor laser oscillator 13 is turned on, a filter

20 is further passed through the image formation lens 19, and the reflected light when the laser beam from the 2nd semiconductor laser oscillator 13 scans a bar code 8c top is condensed to a photo detector 21.

[0028] Moreover, when a read object is bar code 14c on a label 14, the 2nd semiconductor laser oscillator 13 is turned off, the 1st semiconductor laser oscillator 12 is turned on, said filter 20 is further passed through said image formation lens 19, and the luminescence light by excitation of fluorescence ink when the laser beam from the 1st semiconductor laser oscillator 12 scans a bar code 14c top is condensed to a photo detector 21. At this time, the reflected light which the laser beam from the 1st semiconductor laser oscillator 12 reflected on the label 14 is cut with a filter 20. By this, only the luminescence light by excitation of fluorescence ink will be received by the photo detector 21.

[0029] therefore, when the cyanine dye of NK-3803 is used as a fluorescence material of fluorescence ink Since it excites by the laser beam which has a peak near 780nm from the 1st semiconductor laser oscillator 12 and 877nm luminescence is performed, as a property of said filter 20 The filter of a property as shown in drawing 10 is used that what is necessary is just to have the property of cutting the wavelength near [ which is excitation light ] 780nm, and passing 877nm of luminescence light, and passing 669nm of the reflected light of the laser beam from the 2nd semiconductor laser oscillator 13.

[0030] moreover, when IRS-F is used as a fluorescence material of fluorescence ink Since it excites by the laser beam which has a peak near 810nm from the 1st semiconductor laser oscillator 12 and 985nm luminescence is performed, as a property of said filter 20 The filter of a property as shown in drawing 11 is used that what is necessary is just to have the property of cutting the wavelength near [ which is excitation light ] 810nm, and passing 985nm of luminescence light, and passing 669nm of the reflected light of the laser beam from the 2nd semiconductor laser oscillator 13.

[0031] Said photo detector 21 changes light-receiving information into an electrical signal, and after it amplifies this electrical signal in an amplifying circuit 22, it supplies it to the recognition section. By the way, although a binary signal is set low [ the portion of a bar ] to "0" by the reflection factor and a binary signal is set high [ the portion of the white between bars ] to "1" by the reflection factor in order to receive the reflected light from a label 8 by the photo detector 21 when reading bar code 8c in a label 8 When reading bar code 14c in a label 14 Since the luminescence light by excitation of fluorescence ink is received by the photo detector 21 and it becomes the case where the portion of a bar emits light, a binary signal is set to "1", and the portion of the white between bars does not emit light, but a binary signal is set to "0", and the reflected light is received, and reverse, a signal is reversed and a bar code is recognized.

[0032] In reading bar code 8c which carried out visible printing from the former which shows a code reader to drawing 13 by considering as such a configuration to a label 8, it turns OFF the 1st semiconductor laser oscillator 12. That what is necessary is just to set it as the mode in which turn ON the 2nd semiconductor laser oscillator 13, and bar code 8c is read by the reflected light from a label 8. Moreover, in reading bar code 14c printed in transparency or the fluorescence ink which cannot appear easily on the label 14 shown in drawing 2, it turns OFF the 2nd semiconductor laser oscillator 13. Any bar code can be read with one code reader that what is necessary is just to set it as the mode in which turn ON the 1st semiconductor laser oscillator 12, and bar code 14c is read by the luminescence light by excitation of fluorescence ink.

[0033] In addition, although the gestalt of operation mentioned above described the case where a bar code was read in the label which printed the bar code using the fluorescence ink which excites by the exposure of the light of specific wavelength and emits light in another wavelength, it is not necessarily what is limited to this. The label which printed the bar code using the transparency or the absorption ink which cannot appear easily which used the charge of an absorber which absorbs the light of specific wavelength is prepared. The semiconductor laser oscillator which outputs the laser beam of the specific wavelength which this absorption ink absorbs as 1st semiconductor laser oscillator is used. If the reflected light from a label is received by the photo detector, light will be absorbed, the portion of the bar of a bar code will serve as black, and since it becomes white by the reflected light between bars, a bar code can be read with the electrical signal from a photo detector. As a charge of an absorber, wavelength should just use the charge of an absorber which shows an absorption property by 700nm or more. At this time, a filter 20 becomes unnecessary. Of course, reading of the bar code from the usual label can be performed by the laser beam from the 2nd semiconductor laser oscillator also in this case. Therefore, also in this case, with one code reader, the bar code from two kinds of labels can be changed, the mode can be read, and the same operation effect as the gestalt of operation mentioned above is acquired.

[0034] In addition, with the gestalt of operation mentioned above, although what used the semiconductor laser oscillator as the light source is described, it cannot necessarily limit to this, and LED, a fluorescent lamp, a halogen lamp, etc. can also be used as the light source. Moreover, although what used the bar code as a required code on management with the gestalt of operation mentioned above was described, it may not necessarily limit to this and two dimensional codes etc. may be other codes.

[0035]

[Effect of the Invention] According to invention claim 1 and given in two, read of the code from the label which printed codes, such as a bar code, in transparency or the

fluorescence ink which cannot appear easily, and read of the code from the label which printed codes, such as a bar code, in usual visible ink can be performed by one set.

[0036] According to invention according to claim 3, read of the code from the label which printed codes, such as a bar code, in the ink which used transparency or the charge of an absorber which cannot be easily visible, and read of the code from the label which printed codes, such as a bar code, in usual visible ink can be performed by one set.

**[Brief Description of the Drawings]**

**[Drawing 1]** The important section block diagram showing the gestalt of operation of this invention.

**[Drawing 2]** Drawing showing the configuration of the label which printed the bar code used with the gestalt of this operation in fluorescence ink.

**[Drawing 3]** Drawing showing the luminescence wavelength property of the semiconductor laser oscillator used with the gestalt of this operation.

**[Drawing 4]** Drawing showing the reflection property of red luminescence printing of the alphabetic character at the time of using a thermographic recording paper as a label in the gestalt of this operation, or a numeric character, and black luminescence printing.

**[Drawing 5]** Drawing showing the excitation property of the fluorescence ink which used cyanine system coloring matter as a fluorescence material in the gestalt of this operation.

**[Drawing 6]** Drawing showing the luminescence property of the fluorescence ink which used cyanine system coloring matter as a fluorescence material in the gestalt of this operation.

**[Drawing 7]** Drawing showing the excitation property of the fluorescence ink which used the pigment of an inorganic system as a fluorescence material in the gestalt of this operation.

**[Drawing 8]** Drawing showing the luminescence property of the fluorescence ink which used the pigment of an inorganic system as a fluorescence material in the gestalt of this operation.

**[Drawing 9]** Drawing showing the important section configuration of the ink jet arm head which prints the bar code of fluorescence ink in the gestalt of this operation.

**[Drawing 10]** Drawing showing the example of a property of the filter used in the gestalt of this operation.

**[Drawing 11]** Drawing showing other examples of a property of the filter used in the gestalt of this operation.

**[Drawing 12]** The important section block diagram showing the conventional example.

**[Drawing 13]** Drawing showing the configuration of the conventional label which

carried out visible printing of an alphabetic character, a numeric character, and the bar code.

[Description of Notations]

12 -- 1st semiconductor laser oscillator

13 -- 2nd semiconductor laser oscillator

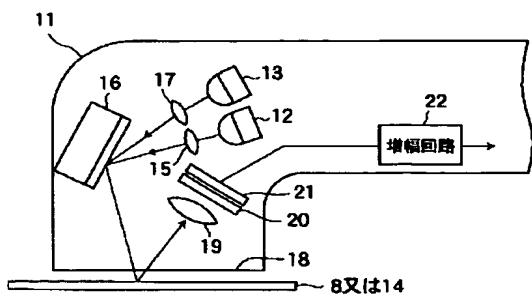
14 -- Label which printed the bar code in fluorescence ink

16 -- GARUBANO device

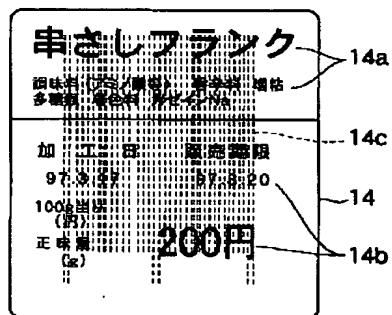
20 -- Filter

21 -- Photo detector

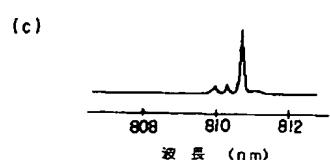
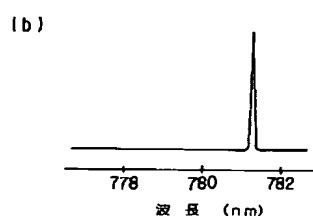
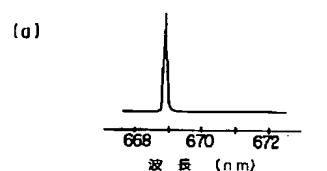
[Drawing 1]



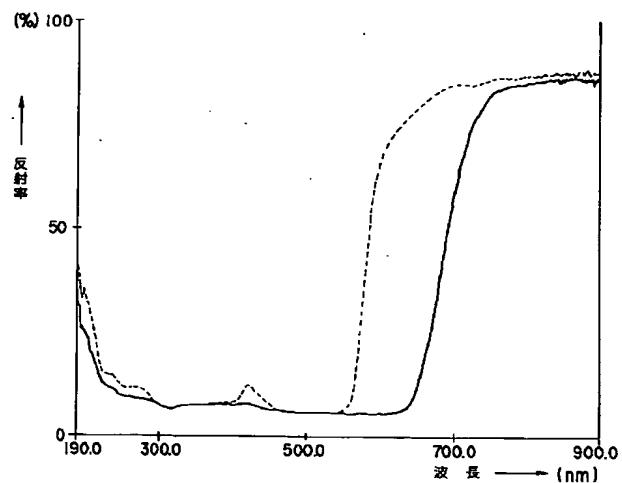
[Drawing 2]



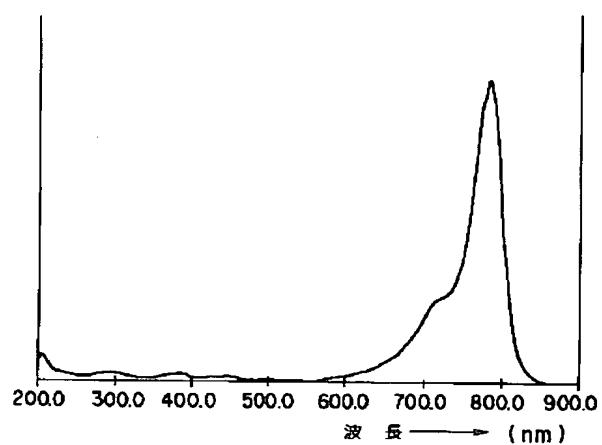
[Drawing 3]



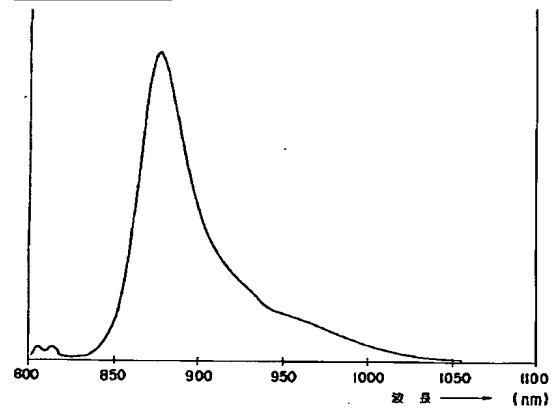
[Drawing 4]



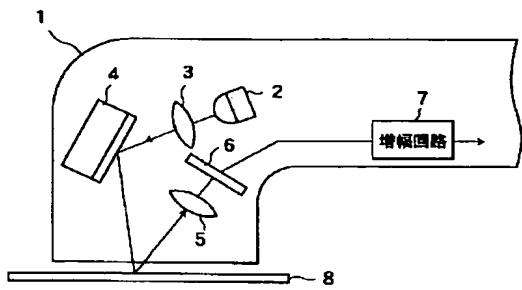
[Drawing 5]



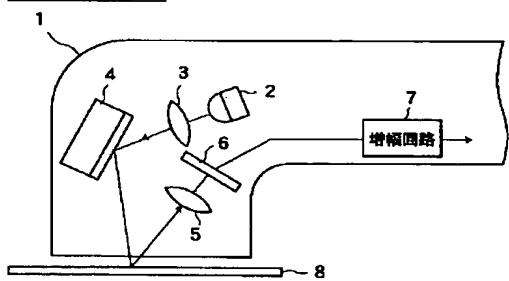
[Drawing 6]



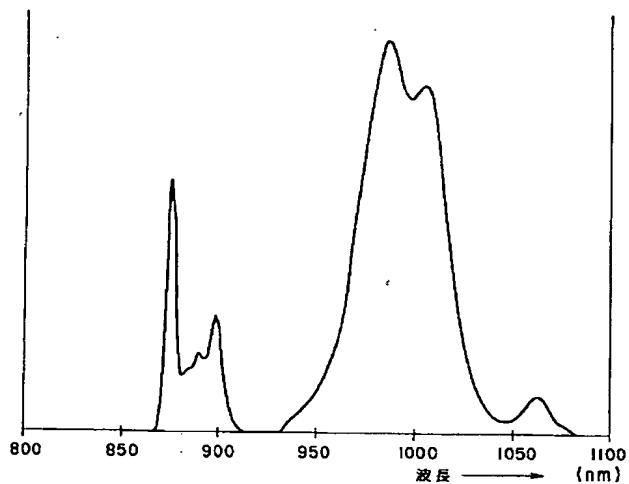
[Drawing 12]



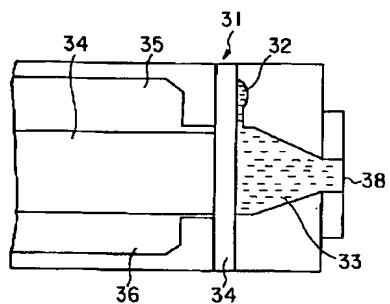
[Drawing 7]



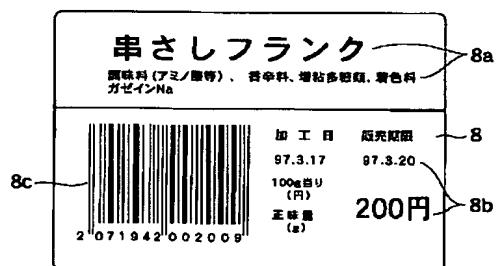
[Drawing 8]



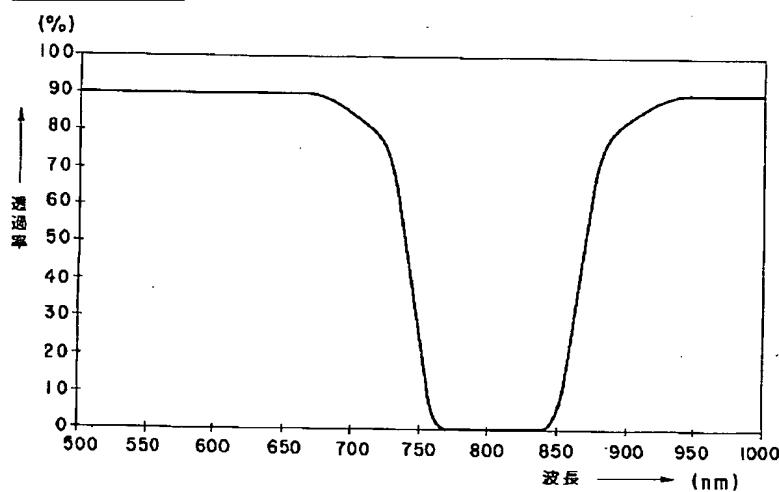
[Drawing 9]



[Drawing 13]



[Drawing 10]



[Drawing 11]

